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E2A

(54) A safety release mechanism for the doors of freight containers, transport vehicles and the like

(57) The emergency release mechanism for a door fastening enables the door to be unlocked by a person who is accidentally shut inside the container or vehicle. The door fastening includes a lever (10) for rotating an operating bar equipped with locking cams, the lever in the locked condition of the door (2) being secured to a retainer (12) which is held fast with the door by permanent fixings. The emergency release mechanism provides releasable fixings for the retainer (12) in the form of rods (25) which can be unscrewed from the inside of the door by turning pins (29). The door is then opened by pushing on a plunger assembly (30). Extension of the plunger assembly through the door urges the unfastened retainer (12) outward from the door, carrying the operating lever with it. The plunger assembly rotates the operating lever and hence the operating rod during actuation.

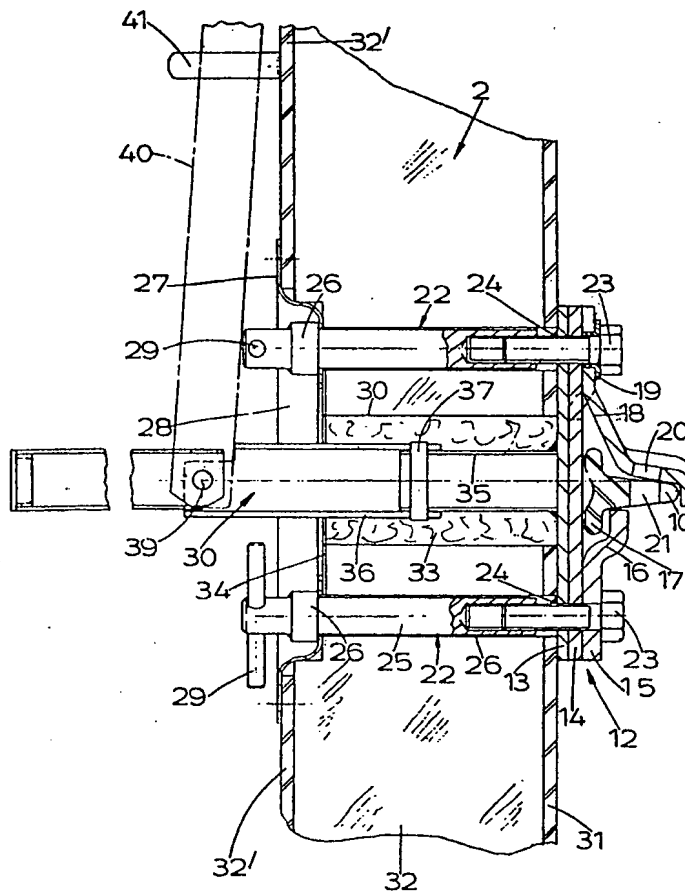


FIG. 2

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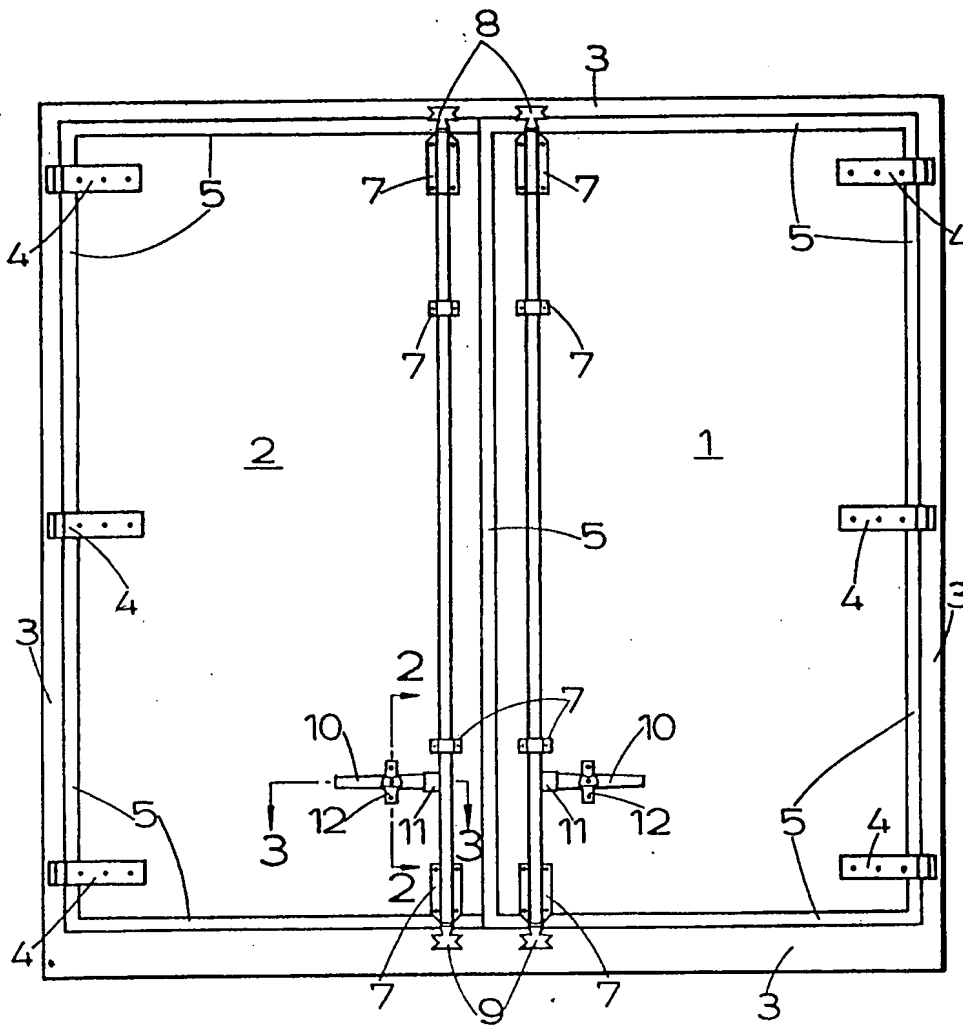


FIG. 1.

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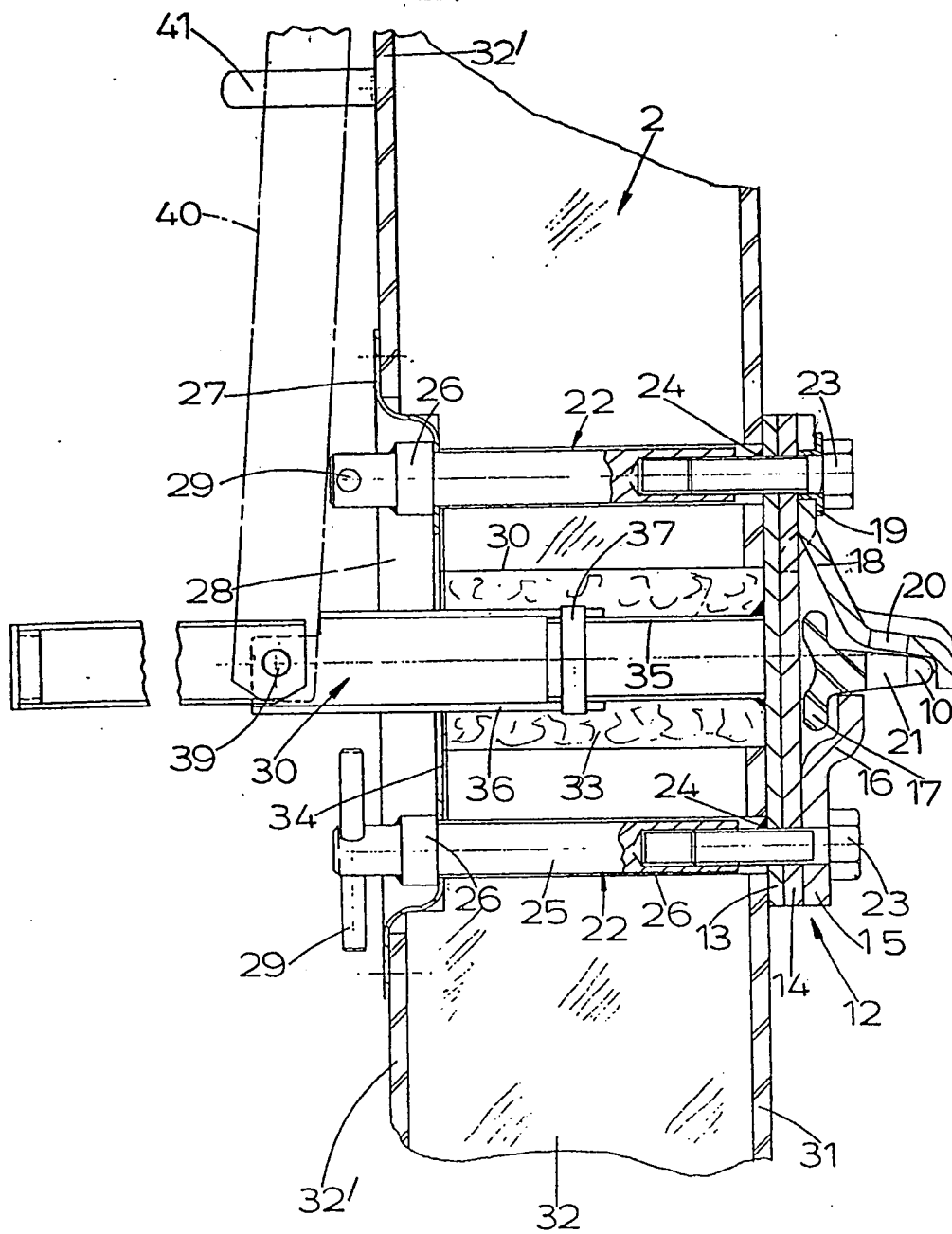


FIG. 2.

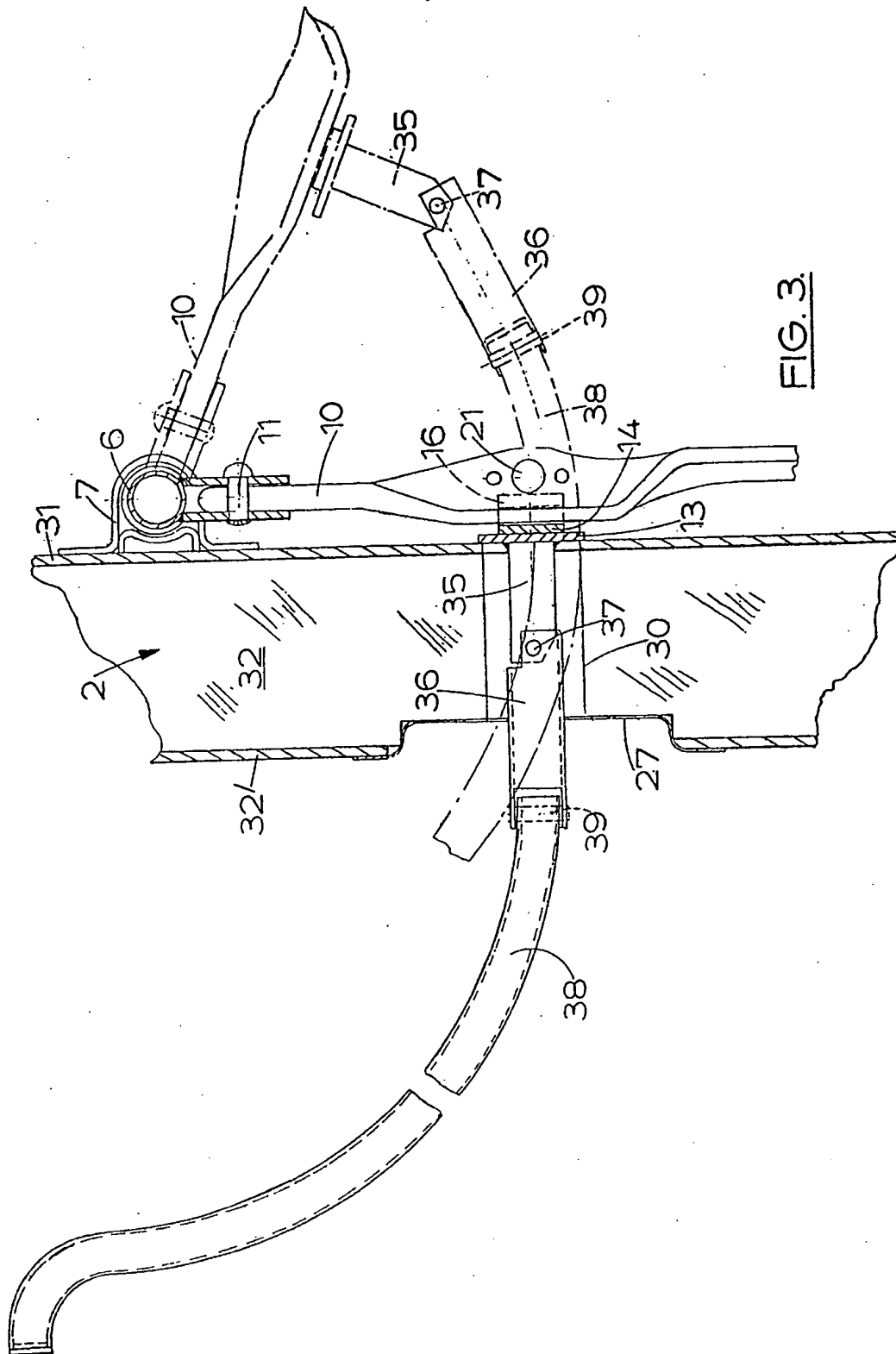


FIG. 3

## SPECIFICATION

**A safety release mechanism for the doors of freight containers, transport vehicles and the like**

This invention relates to a safety release mechanism for the doors of freight container bodies, transport vehicle bodies and the like.

10 The doors of freight containers and transport vehicles are commonly provided with a door locking mechanism which comprises an operating rod rotatably mounted on the outside of the door, a pair of cams on opposite  
15 ends of the operating rod, and a pair of keepers secured to the body frame for locking engagement by the respective cams. A lever is connected to the operating rod to enable the rod to be turned for locking and unlocking of  
20 the cams with the keepers. Such a door locking mechanism will hereinafter be referred to as a 'door locking mechanism of the set forth'.

The lever is usually secured to a lever  
25 retainer by a padlock or a customs seal when the body is in use, the lever retainer being permanently secured to the door.

There is a small danger that a person may become locked in a freight container or  
30 vehicle body, when the door of doors are closed by somebody else. This represents a more serious hazard with refrigerated bodies since, although a person locked in a non-refrigerated body may in time be able to draw  
35 attention to his situation, a person locked in a refrigerated body would have a rather limited time to attract attention.

According to the invention a safety release mechanism for a door locking mechanism of  
40 the kind set forth comprises a lever retainer provided with means for connection to the lever at a position spaced from the operating rod, the lever retainer being mounted on the outer end of a plunger assembly which is  
45 adapted to extend slidably through a suitable aperture in the door, the inner end of the plunger assembly providing a hand grip portion accessible from the inner side of the door, and a manually releasable locking  
50 means accessible from the inner side of the door for retaining the lever retainer in a normal position in which, with the lever connected to the lever retainer, the operating rod is in its locked position.

55 The locking means is arranged to be operable by hand without any tools so that a person trapped in the container or vehicle body can simply release the locking means and then, holding the inner end of the plunger assembly, push the plunger assembly outwards through the door, thereby operating the lever to rotate the operating rod and release the cams from the keepers. The door can then be pushed open.

65 The inner end of the plunger assembly is

preferably pivoted to enable the inner end to be stowed against the inner face of the door. Preferably a spring clip is mounted on the inner face of the door to hold the folded  
70 plunger assembly.

The locking means may engage with the lever retainer or with the plunger. In a preferred arrangement the locking means comprises at least one threaded fastener extending  
75 through the door, the outer end of the fastener cooperating with the lever retainer normally to retain it in position adjacent the outer face of the door, and the inner end of the fastener comprising a finger engageable  
80 screw, turning of the screw being arranged to release the lever retainer.

The seals around the edges of container and vehicle body doors often become frozen fast, particularly with refrigerated vehicles. It  
85 is therefore known to arrange the profile of the cams and keepers such that a positive opening force is applied to a door during the latter part of the opening movement of the operating lever.

In order to facilitate substantial angular movement of the lever by the plunger assembly, the plunger assembly is preferably articulated at at least one intermediate position in its length to enable it to bend about an  
90 axis parallel to that of the operating rod.

In one preferred arrangement the inner end of the operating rod is curved to facilitate full angular movement of the lever.

A safety release mechanism in accordance  
100 with the invention will now be further described, by way of example only, with reference to the accompanying drawings in which:-

*Figure 1* is an end view of a refrigerated  
105 freight container;

*Figure 2* is a vertical cross-section through a portion of one of the doors of the freight container of Fig. 1, generally on the line 2-2; and

110 *Figure 3* is a horizontal cross-section on the line 3-3 of Fig. 1.

Fig. 1 shows a conventional refrigerated freight container having a pair of doors 1,2 hingedly mounted on the frame 3 of the container by hinges 4 and sealed to the frame 3 and to each other in the closed condition of the door by door edge seals 5. Each door carries on its outer face a respective rotatable, vertical operating rod 6 journaled in brackets  
120 7 secured to the outer face of the door, and upper and lower cams 8, 9 project beyond the upper and lower sides of the door for cooperation in known manner with respective cams, not shown, mounted on the frame 3.  
125 Examples of suitable cams and keepers are shown in our U.K. Patent Specification No. 1506763.

A respective operating lever 10 is connected to each operating rod 6 by a horizontal pivot 11, and with the door closed as shown

and with the operating rod 6 in the locked position as shown the lever 10 lies against the outer face of the door. During transportation of the container the levers 10 are secured to  
 5 respective lever retainers 12 by padlocks or custom seals.

So far what has been described with reference to Fig. 1 is conventional, but the novel fixing arrangement of retainers 12 will now be  
 10 described with reference to Figs. 2 and 3. The retainer 12 comprises a sandwich construction of three metal strips 13, 14, 15 welded together, the outer strip 15 being much shorter than strips 13, 14 and being cranked  
 15 outwardly of the door to provide a retaining lip 16 for engagement around the downwardly directed flange 17 of the lever 10 of T-section. A catch 18 is pivotally mounted on a bush 19 and is provided with a hole 20 to  
 20 receive a padlock or customs seal, not shown, which also passes through an aligned hole 21 provided in the largest flange of the lever.

The retainer 12 is normally held in place by a pair of releasable fasteners 22 each comprising a bolt 23 tack welded at 24 to plate  
 25 13 and threadedly engaged at its inner end with a rod 25 received in a hole 26 drilled through the door 2. Each rod 25 is formed at its inner end with an enlargement 26 which  
 30 abuts with a dished abutment plate 27 fitted in a circular recess 28 formed in the inner face of the door. A transverse pin 29 in the inner end of each rod 25 provides a finger grip to enable the rods 25 to be turned from  
 35 the inside of the door. The tack welds 24 hold the bolts 23 against turning when the rods 25 are turned from the inside of the door.

A plunger assembly 30 extends with substantial clearance through a bore 30 in the  
 40 door, which comprises an outer metal skin 31, an insulative filling 32, and an inner metal skin 32', and in order to minimise the reduction in the insulative properties of the door the plunger assembly 30 is surrounded  
 45 by loose insulation material 33 between plate 13 and a heavy duty polythene gasket 34 clamped between plate 27 and the base of recess 28.

The plunger assembly 30 comprises a first  
 50 tubular portion 35 welded at its outer end to the back of plate 13, a second tubular portion 36 pivoted to first portion 35 by a pin 37 about an axis parallel to the operating rod 6, and curved third portion 38 pivotally connected to portion 36 by a horizontal pin 39  
 55 which enables the plunger portion 38 to be pivoted upwardly for stowing, as indicated by 40 in Fig. 2, against the inner skin 32. A spring clip 41 is a provided to hold the  
 60 stowed portion 40.

In the event that a person is locked in the container he would unscrew the rods 25 from bolts 23 using pins 29, release plunger portion 40 from clip 41 and bring it to the  
 65 horizontal position shown in full outline in Fig.

2. He would then push on the plunger portion 38 with a sufficient force to push the plunger assembly through the door. This would completely release the retainer 12 from the outer  
 70 skin 31 of the door, and the lever 10 would be turned to operate the rod 6 and thereby release the cams 8 from their associated keepers, enabling the door to be opened.

The lever 10 can move at least as far as the  
 75 position shown in dotted outline in Fig. 3, this being facilitated firstly by the pivot 37, and secondly by the curved portion 38 of the handle.

Movement of the curved portion 38  
 80 through the aperture 30 is facilitated by the large size of the aperture, and by the filling 33 and polythene gasket 34 which will give sufficiently to accommodate passage of curved portion 38.

In a modification, not shown, the portion 38 is straight, but pivot 39 is arranged parallel to pin 37.

#### CLAIMS

90 1. A safety release mechanism for a door locking mechanism of the kind set forth comprising a lever retainer provided with means for connection to the lever at a position spaced from the operating rod, the lever  
 95 retainer being mounted on the outer end of a plunger assembly which is adapted to extend slidably through a suitable aperture in the door, the inner end of the plunger assembly providing a hand grip portion accessible in  
 100 use from the inner side of the door, and a manually releasable locking means accessible in use from the inner side of the door for retaining the lever retainer in a normal position in which, in use with the lever connected  
 105 to the lever retainer, the operating rod is in its locked position.

2. A safety release mechanism according to claim 1 in which the inner end of the  
 110 plunger assembly is pivoted to enable the inner end to be stowed in use against the inner face of the door.

3. A safety release mechanism according to claim 2 comprising a spring clip adapted to be mounted on the inner face of the door to  
 115 hold the folded plunger assembly.

4. A safety release mechanism according to any preceding claim in which the locking means engages the lever retainer.

5. A safety release mechanism according to claim 4 in which the locking means comprises at least one threaded fastener adapted to extend through the door, the outer end of the fastener being adapted to cooperate with the lever retainer normally to retain it in  
 120 position adjacent the outer face of the door, and the inner end of the fastener comprising a finger engageable screw, the arrangement being such that in use turning of the screw releases the lever retainer.

130 6. A safety release mechanism according

to any preceding claim in which the plunger assembly is articulated at at least one intermediate position in its length to enable it to bend about an axis parallel to that of the operating rod.

5 7. A safety release mechanism according to any preceding claim in which the inner end of the plunger assembly is curved to facilitate angular movement of the operating rod.

10 8. A safety release mechanism according to claim 7 comprising a gasket adapted to be positioned adjacent the inner face of the door, the gasket having sufficient give to accommodate passage of the curved portion of the plunger assembly on operation of the plunger assembly.

15 9. A safety release mechanism of the kind set forth substantially as herein described with reference to the accompanying drawings.

20 10. A door locking mechanism of the kind set forth in conjunction with a safety release mechanism as claimed in any of the preceding claims.

25 11. A freight container body, transport vehicle body or the like fitted with a door locking mechanism of the kind set forth in combination with a safety release mechanism for said door locking mechanism as claimed in any of claims 1 to 9.

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